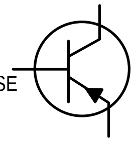
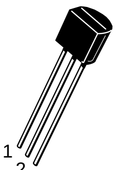
Amplifier Transistors
PNP Silicon

BC307,B,C
BC308C
BC309B





CASE 29–04, STYLE 17
TO–92 (TO–226AA)

MAXIMUM RATINGS

Rating	Symbol	BC 307	BC 308C	BC 309	Unit
Collector–Emitter Voltage	V_{CEO}	–45	–25	–25	Vdc
Collector–Base Voltage	V_{CBO}	–50	–30	–30	Vdc
Emitter–Base Voltage	V_{EBO}	–5.0			Vdc
Collector Current — Continuous	I_C	–100			mAdc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	350 2.8			mW mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	1.0 8.0			Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150			°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	357	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	125	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage (I_C = –2.0 mAdc, I_B = 0)	BC307 BC308C BC309B	$V_{(BR)CEO}$	–45 –25 –25	— — —	— — —	Vdc
Emitter–Base Breakdown Voltage (I_E = –100 μAdc, I_C = 0)	BC307 BC308C BC309B	$V_{(BR)EBO}$	–5.0 –5.0 –5.0	— — —	— — —	Vdc
Collector–Emitter Leakage Current (V_{CES} = –50 V, V_{BE} = 0) (V_{CES} = –30 V, V_{BE} = 0)	BC307 BC308C BC309B	I_{CES}	— — —	–0.2 –0.2 –0.2	–15 –15 –15	nAdc
(V_{CES} = –50 V, V_{BE} = 0) T_A = 125°C	BC307		—	–0.2	–4.0	μA
(V_{CES} = –30 V, V_{BE} = 0) T_A = 125°C	BC308C BC309B		— —	–0.2 –0.2	–4.0 –4.0	

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (Continued)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				—
(I_C = –10 µAdc, V_{CE} = –5.0 Vdc)	BC307B/309B		—	150	—	
	BC307C/308C		—	270	—	
(I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc)	BC307		120	—	800	
	BC308C		120	—	800	
(I_C = –100 mAdc, V_{CE} = –5.0 Vdc)	BC307B/309B		200	290	460	
	BC307C/308C		420	500	800	
	BC307B/309B		—	180	—	
	BC307C/308C		—	300	—	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				Vdc
(I_C = –10 mAdc, I_B = –0.5 mAdc)			—	–0.10	–0.3	
(I_C = –10 mAdc, I_B = see Note 1)			—	–0.30	–0.6	
(I_C = –100 mAdc, I_B = –5.0 mAdc)			—	–0.25	—	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$				Vdc
(I_C = –10 mAdc, I_B = –0.5 mAdc)			—	–0.7	—	
(I_C = –100 mAdc, I_B = –5.0 mAdc)			—	–1.0	—	
Base–Emitter On Voltage (I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc)		$V_{BE(on)}$	–0.55	–0.62	–0.7	Vdc
DYNAMIC CHARACTERISTICS						
Current–Gain — Bandwidth Product		f_T				MHz
(I_C = –10 mAdc, V_{CE} = –5.0 Vdc, f = 100 MHz)	BC307		—	280	—	
	BC308C		—	320	—	
	BC309B		—	360	—	
Common Base Capacitance (V_{CB} = –10 Vdc, I_C = 0, f = 1.0 MHz)		C_{cbo}	—	—	6.0	pF
Noise Figure		NF				dB
(I_C = –0.2 mAdc, V_{CE} = –5.0 Vdc,	BC309		—	2.0	4.0	
R_S = 2.0 kΩ, f = 1.0 kHz)	BC307		—	2.0	10	
(I_C = –0.2 mAdc, V_{CE} = –5.0 Vdc,	BC308C		—	2.0	10	
R_S = 2.0 kΩ, f = 1.0 kHz, f = 200 Hz)	BC309B		—	2.0	4.0	

1. I_C = –10 mAdc on the constant base current characteristic, which yields the point I_C = –11 mAdc, V_{CE} = –1.0 V.

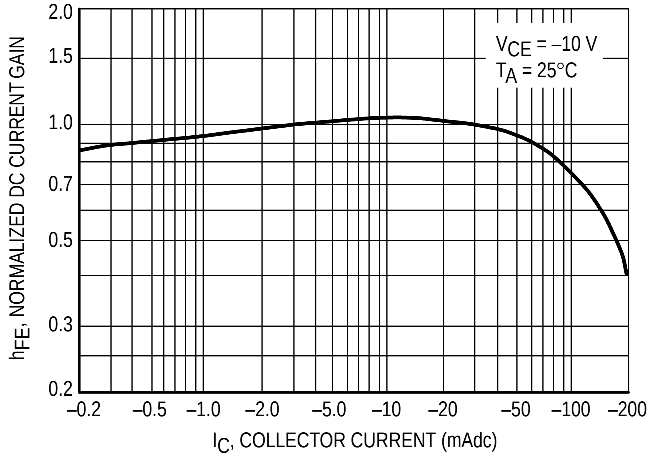


Figure 1. Normalized DC Current Gain

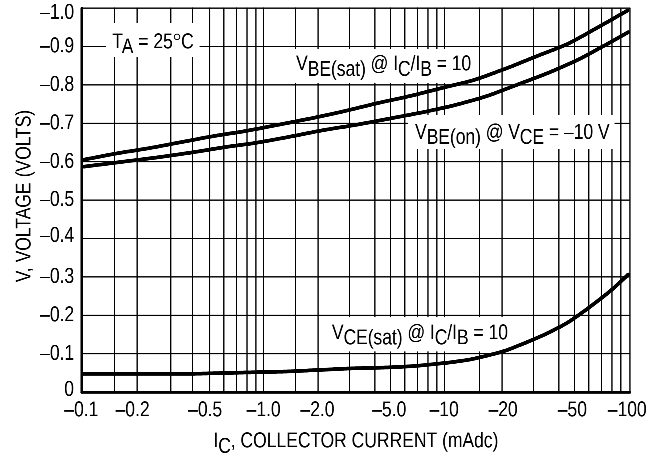


Figure 2. “Saturation” and “On” Voltages

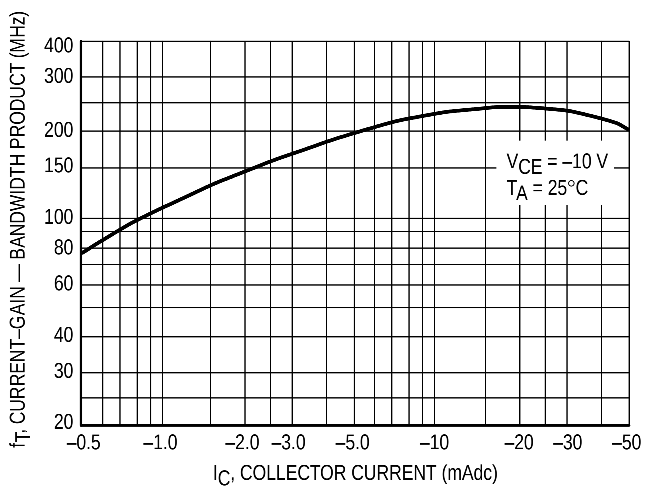


Figure 3. Current–Gain — Bandwidth Product

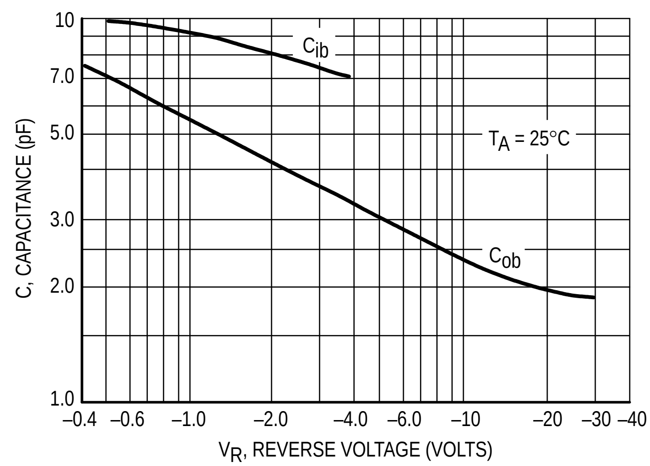


Figure 4. Capacitances

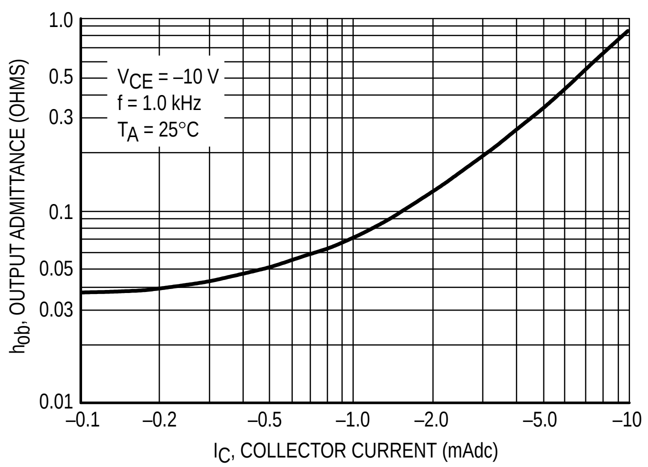


Figure 5. Output Admittance

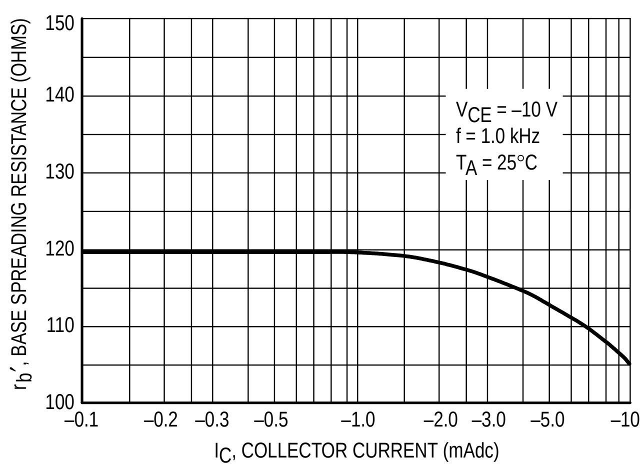
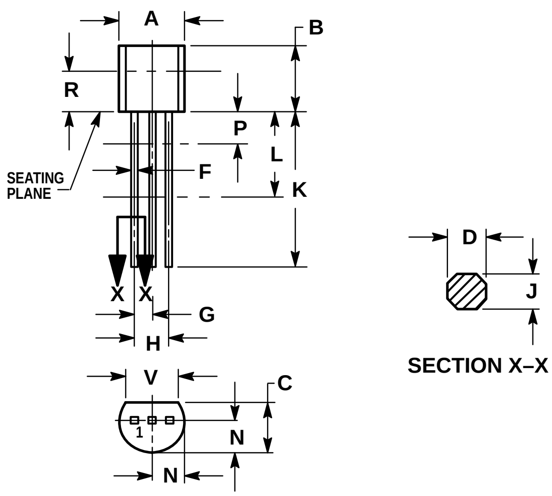


Figure 6. Base Spreading Resistance

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. DIMENSION F APPLIES BETWEEN P AND L. DIMENSION D AND J APPLY BETWEEN L AND K MINIMUM. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.022	0.41	0.55
F	0.016	0.019	0.41	0.48
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	—	12.70	—
L	0.250	—	6.35	—
N	0.080	0.105	2.04	2.66
P	—	0.100	—	2.54
R	0.115	—	2.93	—
V	0.135	—	3.43	—

CASE 029–04
(TO–226AA)
ISSUE AD

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

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